UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/704,509	11/06/2003	Jong Mo Sung	2013P117	4065

8791 7590 10/01/2008

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER
SAINT CYR, LEONARD

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
10/01/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/704,509	SUNG ET AL.	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1 - 6, 9 - 12, 18 - 20, 23, 24, and 28* is/are rejected.

7)☐ Claim(s) *7, 8, 13 - 17, 21, 22, and 25 - 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/06/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 06/04/08 have been fully considered but they are not persuasive.

Applicant argues that the examiner failed to show a teaching, suggestion, or motivation to combine the references; and the examiner impermissibility uses hindsight based on the invention to defeat patentability of the invention (Amendment, pages 14 – 16).

The examiner disagrees, Omari et al., teach "since the frequency band is narrow, there is a problem in that the sound quality is poor. Therefore, in order to overcome this problem, a technique has been developed in which a narrow-band signal…converted into a wide-band signal" (col.1, lines 20 - 29). Using a narrow-band signal at the transmission side, and a wide-band signal at the receiving side in order to overcome the sound quality problem is a motivation found in Omari et al. Thus, the examiner does not use hindsight based on the invention to defeat patentability of the invention.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 18, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejaco (US Patent 6,260,009) in view of Omari et al. (US Patent 6,711,538).

Regarding claims 1, 18, and 28 Dejaco discloses a transcoding apparatus between code-excited linear prediction (CELP)-based codecs using bandwidth extension (see col. 6, lines 1-2), the apparatus comprising:

an excitation signal parameter converter which converts excitation signal parameters from an input narrowband bitstream, into excitation signal parameters in an output wideband CELP format (see col. 2, lines 49-53);and

a quantizer which quantizes the wideband CELP format formant parameters converted in the formant parameter converter and the wideband CELP format excitation signal parameter converted in the excitation signal parameter converter, respectively in an output CELP format (see fig.5, step 506 and col. 6, lines 61-62).

Dejaco does not disclose a formant parameter converter which extracts formant parameters from an input narrowband bitstream, and converts the extracted formant parameters into formant parameters in an output wideband CELP format. However this feature is well known in the art as indicated by Omari et al. US 6,711,538. Omari et al. discloses converting formant parameters from narrowband to wideband CELP format (see col. 2, lines 46-49). Thus it would it would have been obvious to one of ordinary skill in the art to combine the method of converting parameters from narrowband to wideband for the benefit of improving sound quality (see col. 1, lines 17- 30).

4. Claims 2-6, 9-12,19-20, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejaco (US Patent 6,260,009) in view of Omari et al. (US Patent 6,711,538) and further in view of Omari et al. (US Patent 6,539,355).

Regarding claims 2 and 19, Dejaco in view of Omari et al, (538) further disclose that the formant parameter Converter comprises:

a formant order converter which converts the order of the bandwidth-extended formant parameters, into the order of an output CELP format; and a formant frame rate converter which adjusts the frame rate of the order-converted formant-parameters in order to fit the frame rate of the output CELP format (Dejaco; see col.2, lines 57-60) and provides the frame rate converted formant parameters to the quantizer (see fig. 7, steps 708 and 712 and col. Lines 15-18).

Dejaco in view of Omari et al. (538) do not disclose a formant bandwidth extender which extracts formant parameters from an input narrow band bitstream and extends the bandwidth of the extracted narrowband CELP format formant parameters, from a narrowband to a wideband. However this feature is well known in the art as evidenced by Omari et al. (355). Omari et al. (355) discloses a bandwidth extending method an apparatus. It would have been beneficial to use bandwidth to improve sound quality of speech signals (see col.1, lines 20-26). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use bandwidth extension.

Regarding claims 3 and 20, Dejaco in view of Omari et al. (538), and further in view of Omari et al., (355) further disclose that the formant parameter converter comprises:

a 1st formant type converter which extracts formant parameters from an input narrowband bitstream, and converts a type of the extracted formant parameters in the narrowband CELP format into a type suitable for formant bandwidth extension; a f0rmant bandwidth extender which extends the bandwidth of narrowband parameters whose type is converted in the 1 st formant type converter, from a narrowband to a wideband (see Omari et al. col. 4, lines 29-39);

a 2nd formant type converter which converts the type of the bandwidth-extended formant parameters, into a formant type suitable for order conversion (Dejaco; see col. 7,. lines 12-14);

a formant order converter which converts the order of the formant parameters whose type is converted in the 2nd formant type converter, into the order of the output CELP format (Dejaco; see col. 7, lines 19-21);

a 3rd formant type converter which converts the type of the order-converted formant parameter, into a formant type appropriate to frame rate conversion (Dejaco; see col. 7, lines 47-50);

a formant frame rate converter which adjusts the frame rate of the formant parameters whose type is converted in the 3rd formant type converter, to fit the frame rate of the output CELP format (Dejaco; see Col. 7, lines 58-62); and

a 4th formant type converter which converts the type of the frame rate converted formant parameter, into a formant type for quantization in the output CELP format, and provides the converted formant coefficients to the quantizer (Dejaco; see col. 8, lines 9-15).

Regarding claim 4, Dejaco in view of Omari et al (538) further in view of Omari et al. (355) further disclose wherein the 1st formant type converter converts a type0f the extracted formant parameters in the ,narrowband "CELP format, into a line spectral frequency (LSF) type (Dejaco; see col. 7, lines 53-55,. where line spectral frequency is equivalent to line spectral pair).

Regarding claim 5, Dejaco in view of Omari et al- (538) further in view of Omari et al. (355) further disclose wherein the 2nd formant type converter converts the type of the formant parameters whose bandwidth is extended to the wideband, into a reflection coefficient type (Dejaco; see col. 7, lines 16-19).

Regarding claim 6, Dejaco in view of Omari et al. (538) further in view of Omari et al. (355) further disclose wherein the 3rd formant type converter converts the type of the formant parameters whose order is adjusted, into a line spectral pair (LSP) type (Dejaco; see col. 7, lines53-55).

Regarding claims 9 and 23, Dejaco in view of Omari et al. (538) further in view of Omari et al. (355) further disclose wherein the formant order converter, if an input order is greater than an output order, decimates the input order to fit the output order, and if an input order is less than an output order, interpolates the input order to fit the output order (Dejaco; see col. 7, lines 31-35).

Regarding claim 10, Dejaco in view of-Omari et al (538) further in view of Omari et al. (355) further disclose wherein in the decimation of the order conversion, the coefficients greater than the output order are replaced by and in the interpolation of order conversion, the same number of 0's as the lacked order are filled (Dejaco; see col. 7, lines 40-42).

Regarding claims 11, 12, and 24, Dejaco in view of Omari et al (538) further in view of Omari et al. (355) further disclose wherein the formant frame rate converter, if an input frame rate is higher than an output frame rate, decimates the coefficients of the input parameter to fit the output frame rate, and if the input frame rate is lower than the output frame rate, interpolates the coefficients of the input parameter to fit the output frame rate (Dejaco; see col. 7, line 63 - col. 8, line 6); the decimated formant coefficients are obtained by applying appropriate weighting to input formant coefficients of a current frame and those of a previous frame and then adding the weighted coefficients, and in the interpolation of the frame rate conversion, frame. rate converted coefficients are obtained by applying appropriate weighting to the input formant coefficients of a current frame and the input formant coefficients of previous frames and summing the weighted coefficients (see Col. 7, line 63 - col. 8, line 6, where the method is simply linear prediction, which is a well-known method discussed in the reference).

Allowable Subject Matter

5. Claim 7, 8, 13 – 17, 21, 22, and 25 - 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: with respect to the allowable claims, none of the prior art either alone or in combination disclose or teach the claimed combination to warrant a rejections under 35 USC 102 or 103.

Regarding claims 7, 8, 21, and 22; none of the prior art either alone or in combination disclose or teach the claim apparatus specifically including: a formant coefficient scaling unit which scales the received narrowband f0rmant coefficients to extend the bandwidth in a formant parameter domain, and obtains formant coefficients corresponding to a low band part of an overall wideband formant coefficient wherein the scaling factor can be determined by a ratio of bandwidth in an input narrowband CELP format and bandwidth in an output wideband CELP format; a narrowband codebook searching unit which by using the received narrowband formant coefficient and referring to a narrowband codebook trained in advance, finds an index of a closest codeword; a wideband codebook searching unit which by referring to a wideband codebook trained in advance, searches for a wideband codeword corresponding to the index of the narrowband codeword searched by the narrowband codebook searching unit; a codeword truncation unit which truncates the wideband codeword searched in the wideband codebook searching unit so that only a component corresponding to the high

band of the wideband remains; and a codeword training .unit which generates the narrowband codebook and the wideband codebook through training.

Regarding claims 13 -17 and 25-27 none of the prior art either alone, or in combination disclose or teach the claim apparatus specifically including:
a perceptual weighted filter (PWF) which is constructed using the formant coefficients obtained through interpolation in the formant coefficient interpolator, and, filters the wideband excitation •signal from the excitation signal bandwidth extender; an adaptive codebook Searcher which regarding the output signal of the PWF as a target signal, searches an adaptive codebook corresponding to pitch information to fit an output CELP format, calculates the gain of the corresponding codebook, and provides the calculated gain and the searched adaptive codebook index to the quantizer
and a fixed codebook searcher which, using a target signal of a fixed codebook obtained by subtracting the contribution• of the adaptive codebook from the output signal of the PWF, searches for a fixed codebook to fit an output CELP format, calculates the gain of the corresponding codebook, and provides the calculated gain and the searched adaptive codebook index to the quantizer.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
09/25/08

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626